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AUTHOR	Trueman, Mark; Hartley, James
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ABSTRACT

This paper reports to attempt to replicate in Britain Britton and Tesser's (1991) study of the relationship between scores on a time management scale and college grades using a larger sample size and a British (rather than American) student population. Subjects were 302 psychology students who completed the 18-item scale after their first term of study. Results were compared with data on an end-of-year examination, coursework grades awarded during the year, and the final end-of-year grade. Results indicated that the three-component structure of the scale used by Britton and Tesser was not sustained, and a revised two-component scale measuring "daily planning" and "confidence in long term planning" was preferred. The results from the Confidence in Long Term Planning sub-scale showed small but significant relationships with scores on coursework, examination results, and end of year assessments. In addition, women students scored significantly higher than men on the Daily Planning sub-scale. (DB)

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Measuring Time-Management Skills: Cross-Cultural Observations on Britton and Tesser's Time Management Scale

Mark Trueman and James Hartley

University of Keele, U.K.

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Abstract

This paper reports an attempt to replicate in Britain Britton and Tesser's (1991) study of the relationship between scores on a time management scale and college grades using a larger sample size. The results indicate that the 3 component structure of the scale used by Britton and Tesser was not sustained, and a revised 2 component scale measuring Daily Planning and Confidence in Long Term Planning was preferred. The results from the Confidence in Long Term Planning sub-scale scale showed small but significant relationships with scores on coursework, examination results and end of year assessments. In addition, women students scored significantly higher than men on the Daily Planning sub-scale.

Measuring Time-Management Skills: Cross-Cultural Observations on Britton and Tesser's Time Management Scale

In an interesting paper published earlier in the Journal of Educational Psychology Britton and Tesser (1991) reported on how few studies of time management had assessed the long-term benefits of time management skills. Britton and Tesser developed a time management scale for students which they administered to 90 students in their first-year introductory psychology class. Four years later they obtained these students' grade point average scores. The authors then carried out a regression analysis which showed that two time management components - labelled Time Attitudes and Short Range Planning -were significant predictors of the grade point average scores and accounted for more variance than did the SAT scores (collected before the students entered college).

Britton and Tesser concluded, as did Macan, Shahani, Dipboye and Phillips (1990), that time management practices influences college achievement and that, as time management skills could be taught, it was important to identify time management skills.

A number of sources in the literature were used to develop items for Britton and Tesser's time management questionnaire. Originally there were 35 items in a Likert type scale and format. Principal components analysis indicated that there were 12 components with eigenvalues greater than 1, but the scree test indicated that only three of these were important. These three components were retained and rotated with a varimax solution. These three components, which accounted for 36% of the variance, were labelled: Short Range Planning; Time Attitudes; and Long Range Planning. Table 1 lists the U.K. equivalent of 17 of the 18 items finally used in Britton and Tesser's scale.

From reading this report it seems that two issues at least are worth further discussion. Firstly, can one generalise from the results obtained from such a small sample? Is the scale robust? And secondly, what might happen in other, cross-cultural, studies? Accordingly, we set out to try and replicate Britton and Tesser's findings with respect to their Time

Management scale using a sample of British university students.

Method

Materials

Britton and Tesser (1991) initially employed a 35-item questionnaire of time management. Factor analysis of this questionnaire resulted in the identification of an 18-item scale which consisted of 3 subscales: a 7-item measure of Short Range Planning; a 6-item measure of Time Attitudes; and a 5-item measure of Long Range Planning. Britton and Tesser (1991) present no evaluation of the psychometric properties of the 18-item scale or the three subscales.

In the present study we employed an amended version of this 18-item scale. The wording of the some of the items was slightly changed to suit the British context and one item was omitted from the Time Attitudes subscale as it did not seem relevant to the British culture ('On an average class day do you spend more time with personal grooming than doing schoolwork?). The revised 17-item scale is presented on the left of Table 1.

Details of scoring

Each scale item had five response categories: 'Always', `Frequently', 'Sometimes', 'Infrequently' and 'Never'. These were scored from 1 to 5 with a high score indicating a positive attempt at managing time. The response, 'Always' was scored as 1 for items 8, 10, 12 and 15 and as 5 for the remainder of the items. The range of possible scores was 17 - 85 on the 17-item Time Management Scale; 7 - 35 on the Short Range Planning sub-scale; 6 - 30 on the Time Attitudes sub-scale; and 5 - 25 on the Long Range Planning sub-scale.

Participants

Our sample consisted of 302 students (80 men and 222 women) following a first-year course in psychology. The average age of the men was 23.4 years and the average age of the women was 23.1 years.

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Procedure

The students were given the scale to complete in January after completing their first term of study for their psychology degree. Data were also collected on (i) an end-of-year examination given at the end of the first year; (ii) coursework marks awarded during the year; and (iii) an end-of-year assessment (based on the exam scores combined with course-work assessment marks).

Results

Psychometric Analysis

The internal reliability of the 17-item scale was assessed using Cronbach's alpha. The total scale was shown to have a reasonable level of internal reliability (Alpha=.77). The values of Alpha for the Short Range Planning, Time Attitudes, and Long Range Planning sub-scales were .81, .57 and .48 respectively.

These findings indicated that the 17-item Total Scale and the 7-item Short Range Planning sub-scale were reliable measures. However, the 5-item Time Attitudes sub-scale showed only a marginal level of internal reliability, and the 5-item Long Range Planning sub-scale was not found to be reliable in its present form.

The data from the 17-item scale were submitted to principal component analysis in an attempt to replicate the three scales identified by Britton and Tesser (1991) using a similar methodology. The Measure of Sampling Adequacy was .83 which indicated that the data were suitable for principal components analysis. Although there were four components with eigen values in excess of 1.0, the Scree test indicated that a two component solution provided a better explanation of the data. The varimax rotated principal components loadings on these two principal components are shown in Table 1.

The results of the principle component analysis indicated only slight agreement with the findings of Britton and Tesser (1991). The present study found that a two component

solution provided the most parsimonious explanation of the variance. These two components explained a total of 37.9% of the variance compared with 36% of the variance explained by the three component solution in the Britton and Tesser study.

Inspection of the component loadings in Table 1 shows that the scale items did not cluster in the manner found by Britton and Tesser. If a cut-off of 0.40 is used for the purposes of interpretation it can be seen that there is only partial support for the component structure found by Britton and Tesser. Three items (16, 13 and 9) failed to load on either component at 0.40. In addition, three of the remaining fourteen items loaded equally highly on both components (items 6, 14 and 17). Finally, two items showed unexpected patterns of component loadings (items 7 and 15).

Tables 1 and 2 about here

These findings, taken together with the poor internal reliabilities for the Time Attitudes and Long-Range Planning sub-scales, indicated the need to revise the structure of the Time Management scale for use with this sample of respondents. This revision was achieved by successively deleting the poorest item from the principle component analysis and re-examining the pattern of component loadings. The optimal solution was found after items 16, 13 and 9 were deleted from the analysis. The component loadings for this revised 14-item scale are shown in Table 2.

The component loadings given in Table 2 show a number of important features. First, the two component solution was confirmed as the most parsimonious explanation of the data. Indeed, 44.1% of the variance is now explained by the two components. Secondly, each item now loads substantially on a single component. This achieves the simple structure lacking in the original analysis depicted in Table 1. Thirdly, it is clear that Britton and Tesser's interpretation of the components is not sufficient to explain the present findings.

The present authors interpret the first component as assessing Daily Planning activities as each item refers to a practical activity carried out each day. The second component seems to measure Confidence in Long Term Planning. For each of these items a longer time span is referred to and several items seem to hint at self-confidence, locus of control or self-efficacy. As such this component seems to be a composite of the Time Attitudes component and Long-Range Planning component identified by Britton and Tesser (1991).

The internal reliability of the new 14-item Time Management scale was found to be 0.79 using Cronbach's Alpha. The 5-item Daily Planning sub-scale produced an alpha of 0.85. The 9-item Confidence in Long-Term Planning sub-scale produced an alpha of 0.71.

Comparisons between men and women

The mean scores on each of the two sub-scales and the total Time Management scale are shown in Table 3. A series of independent t-tests was carried out to compare the means of the men and women students on these scales.

Table 3 about here

Table 3 shows that there was a significant sex difference in the Daily Planning scores ($t = 5.68$, $df = 300$, $p < .001$). The women students reported that they engaged in more frequent daily planning of their academic work than did the men.

Table 3 also shows, however, that there was no significant difference between the Confidence in Long Term Planning scores of the men and women respondents ($t = 1.45$, $df = 300$, nsd).

In terms of the total Time Management scores, however, there was a significant difference between the responses of the men and the women students ($t = 4.14$, $df = 300$, $p < .001$). The women students reported greater time management concerns than did the men students.

Time management and academic performance

Data on the end-of-year performance of 74 men and 282 women students were available at the time of writing. These data consisted of an end-of-year examination score, an average course-work mark for written work done during the year, and an end-of-year assessment score (which was the average of the examination score and the mark for course-work done during the year). The correlations between the Daily Planning sub-scale scores, the Confidence in Long-Term Planning sub-scale scores, the total Time Management Scale scores, and these measures of academic performance are shown in Table 4. These correlations indicate that there is very little relationship between these sets of time management scores and academic outcomes at the end of the first year of study.

Table 4 about here

Multiple Regression Analysis

Having assessed the bi-variate relationships between the time management scores and the measures of academic performance an attempt was made using stepwise multiple regression to examine the relative ability of the time management scales to predict academic performance.

The Daily Planning scores and the Confidence in Long Term Planning scores were used to predict examination performance, course-work performance, and overall academic performance. These analyses were carried out separately for the total sample (men and women together) who provided complete data on all these measures (74 men 208 women).

To summarise briefly the results: the Confidence in Long Term Planning sub-scale scores significantly predicted the examination scores for the total sample, the men and the women; and the Confidence in Long Term Planning scores significantly predicted the course-work scores and the overall assessment scores for the total sample and for the women. The

adjusted $\underline{R}^2$, which measures the proportion of variance in the dependent variable (academic performance) accounted for by the statistically significant independent variable (Confidence in Long Term Planning score), was always small and varied from .016 to .038. This indicated that between 1.6% and 3.8% of the variance in academic performance was accounted for by Confidence in Long Term Planning scores. However, in none of the nine separate analyses did the Daily Planning score significantly predict academic achievement.

We may conclude from these analyses that Confidence in Long Term Planning scores have a small but statistically significant effect on academic performance which is more noticable for women students than it is for men.

Discussion

The results of our study qualify the findings of Britton and Tesser in the following ways:

(1) Our study (with a larger sample size, and a slightly shorter scale) suggests that two components are important in time management for students - Daily Planning, and Confidence in Long Term Planning - rather than the three (Short Range Planning, Long Range Planning and Time Attitudes) suggested by Britton and Tesser. In the present study, these two components account for 44% of the variance compared with 36% of variance accounted for by Britton and Tesser's three components.

(2) Britton and Tesser did not report analyses for men and women students separately in their study. The present study shows that women students scored significantly higher than the men on the Daily Planning sub-scale of the questionnaire (and, thus, overall). These results on daily planning tie in with those of Macan et al. (1990) and with other studies of gender differences in planning and academic performance (e.g. see Stricker, Rock & Burton, 1993, and Warrick & Naglieri, 1993).

(3) Britton and Tesser found the following correlations between scores on their Time

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Management scale and GPA scores taken four years later: Short Range Planning and GPA 0.25; Time Attitudes and GPA 0.39; Long Range Planning and GPA -0.10. In our one year study the overall correlation (for men and women combined) between Daily Planning and end-of-year assessment was 0.04 (ns) and between Confidence in Long Term Planning and the overall end-of-year assessment it was 0.21 ($p<.001$). These different sets of correlations seem somewhat contradictory: Britton and Tesser's results suggest that short-term planning is more important than long-term planning in predicting academic performance whereas our results, like those of Macan et al. (1990) suggest the reverse.

(4) Britton and Tesser found that scores on their Time Attitudes sub-scale and scores on their Short-Range planning sub-scale significantly predicted GPAs four years later. Our study found that only scores on the Confidence in Long-Term Planning sub-scale significantly predicted academic performance at the end of the first year. However, the present study also found that barely 4% of the variance in academic performance was accounted for by time managment scores whereas Britton and Tesser found that approximately 21% of the variance in GPA was explained by Time Attitude and Short-Range planning scores.

Such these differences may result from any combination of four factors: we used different scales, different participants, a different time scale, and a different culture. More research is needed (with our scale in the US - and other cultures) to see if our findings about the psychometric structure of our scale are robust, and whether not the differences reprinted in this paper between the relationships between Time Management scores and academic performance are a cultural phenomenon - or not.

Authors' Note

We are indebted to Bruce Britton and Abraham Tesser for their permission and encouragement to use their materials, and to the students who took part in this investigation. Correspondence concerning this article should be addressed to Mark Trueman, Department of Psychology, Keele University, Staffordshire, ST5 5BG, UK.

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Table 1

Varimax Rotated Component Loadings for the U.K. Equivalent of the Original 17-item Time Management Scale.

	Component One	Component Two
Short Range Planning		
1. Do you make a list of the things you have to do each day?	.76	-.11
2. Do you plan your day before you start it?	.73	.13
3. Do you make a schedule of the activities you have to do on work days?	.78	.04
4. Do you write a set of goals for yourself each day?	.79	-.04
5. Do you spend time each day planning?	.73	.00
6. Do you have a clear idea of what you want to accomplish during the next week?	.40	.42
7. Do you set and keep priorities?	.32	.49

table continues

Time Attitudes		
8. Do you often find yourself doing things which interfere with your studying simply because you hate to say "No" to people?*	-.19	.55
9. Do you feel you are in charge of your own time, by and large?	-.12	.38
10. Do you believe that there is room for improvement in the way you manage your time?*	.16	.59
11. Do you make constructive use of your time?	.28	.58
12. Do you continue to carry out unprofitable routines or activities?*	-.10	.47
Long Range Planning		
13. Do you usually keep your desk clear of everything other than your current task?	.30	.32
14. Do you have a set of goals for the entire term?	.41	.42

table continues

15. Are you still working on a major assignment the night before it is due?*	.12	.60
16. When you have several things to do, do you think it is best to do a little bit of work on each one?	.15	-.19
17. Do you regularly review your lecture notes, even when a test is not imminent?	.42	44
% Variance accounted for:	25.1%	12.8%

*These items were reversed scored, for example, responses of "never" were given a score of 5.

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Table 2

Varimax Rotated Component Loadings for the Revised 14-item Time Management Scale

	Component One	Component Two
1. Do you make a list of the things you have to do each day?	.79	-.03
2. Do you plan your day before you start it?	.72	.22
3. Do you make a schedule of the activities you have to do on work days?	.77	.14
4. Do you write a set of goals for yourself each day?	.80	.06
5. Do you spend time each day planning?	.75	.09
6. Do you have a clear idea of what you want to accomplish during the next week?	.32	.50
7. Do you set and keep priorities?	.23	.56
8. Do you often find yourself doing things which interfere with your studying simply because you hate to say "No" to people?*	-.24	.47
10. Do you believe that there is room for improvement in the way you manage your time?*	.07	.63

table continues

11. Do you make constructive use of your time?	.21	.62
12. Do you continue to carry out unprofitable routines or activities?*	-.16	.46
14. Do you have a set of goals for the entire term?	.31	.50
15. Are you still working on a major assignment the night before it is due?*	.04	.62
17. Do you regularly review your lecture notes, even when a test is not imminent?	.32	.52
% Variance accounted for:	29.4%	14.7%

*These items were reversed scored, for example, responses of "never" were given a score of 5.

Table 3.

The Mean Scores (and the Standard Deviations) Obtained by the Men and Women Students on the Two Sub-Scales and the Total Time-Management Scale.

		Men N = 80	Women N = 222
Daily Planning	$\bar{x}$	12.0	15.0
	sd	3.9	4.1
Confidence in Long Term Planning	$\bar{x}$	25.8	26.7
	sd	5.8	4.5
Overall	$\bar{x}$	37.7	41.7
	sd	7.8	7.1

Table 4

Intercorrelations Between Scores on the Time Management Scale and Measures of Academic Performance (14-Item Scale).

	Exam Score	Course-work	Assessment
Men			
Daily Planning	.02	.01	.02
Confidence	.24*	.09	.20*
Total	.19	.07	.15
Women			
Daily Planning	-.01	-.01	-.01
Confidence	.15*	.18**	.19**
Total	.09	.11	.12*
Total			
Daily Planning	.04	.03	.04
Confidence	.19***	.16**	.20***
Total	.15**	.12*	.16**

* $p<.05$ ** $p<.01$ *** $p<.001$

N.B. Sample sizes vary slightly because of missing data for some students.

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February 7, 1996

Dr. Mark Trueman
Department of Psychology
Keele University
Staffordshire ST5 5BG
England, United Kingdom

Dear Dr. Trueman:

The ERIC Clearinghouse on Higher Education has received a 4-page article titled "Measuring Time Management Skills: A Cross-Cultural Study" that you and Dr. James Hartley delivered at the annual meeting of the American Educational Research Association. We would like very much to include this presentation in the ERIC data base, however we will need to receive a full version of the paper. It is noted on your paper that a full version is available from you upon request.

Thank you very much for your attention to our request.

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